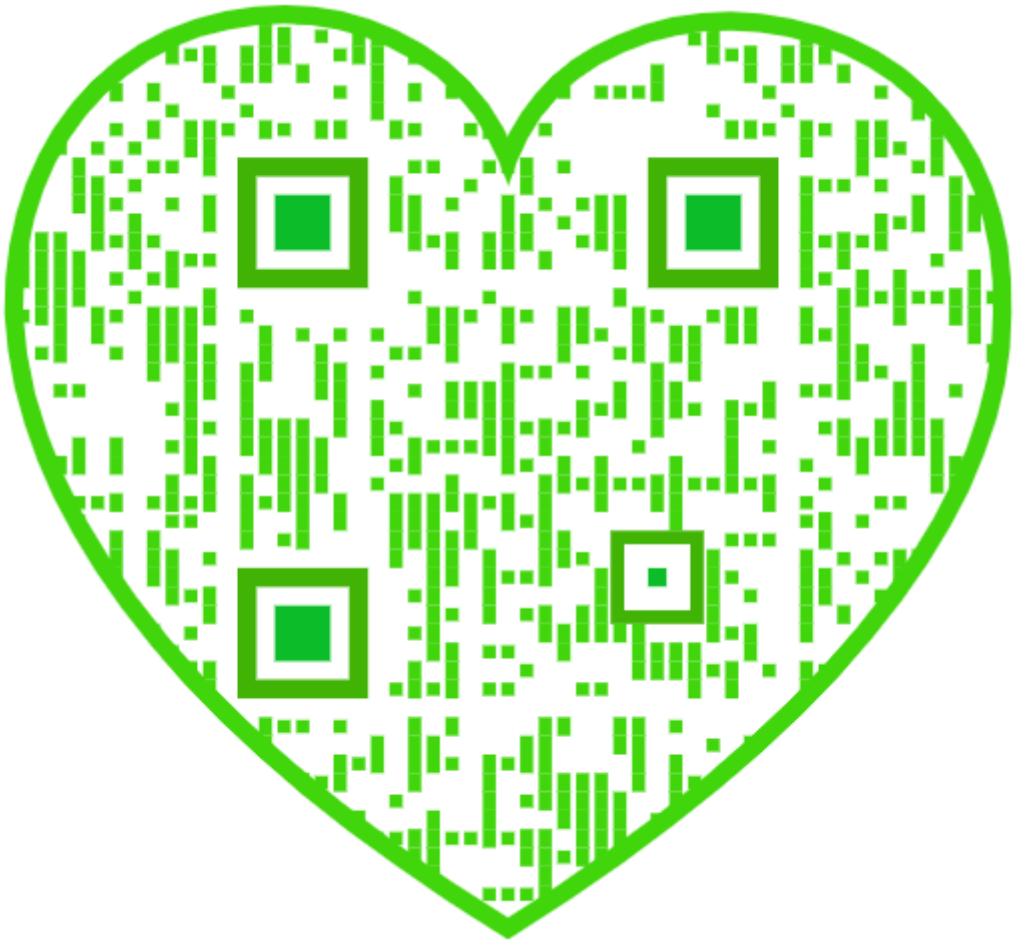

CULTURE OF THE VINE

UNDER GLASS.

A COMPREHENSIVE VIEW

OF THE

CULTURE OF THE VINE

UNDER GLASS,

BY JAMES ROBERTS,

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TO

CHARLES HAMPDEN TURNER, ESQUIRE,

ROOKS' NEST, SURREY,

THE FOLLOWING PAGES ARE, BY PERMISSION, MOST RESPECTFULLY DEDICATED, BY HIS FAITHFUL AND OBLIGED SERVANT,

JAMES ROBERTS.

PREFACE.

In submitting to the Public this plain practical Treatise on the Vine under Glass, I hope it will not be thought presumption in me, by my more competent brethren, (having no wish to disparage their abilities,) to express my decided opinion that we have not progressed in the culture of this noble exotic for the last twenty years, in the same ratio as in that of the minor fruits.

It is my intention to bring within the reach of amateurs and my less successful brethren, a more certain method of cultivating this superior fruit, which, on the table of the nobleman, the gentleman, and

amateur, holds so conspicuous a place in the dessert. Having made it my study for several years past, to bring the vine into a bearing state earlier than what is commonly practiced. Having given ample proofs of success, as the London Horticultural Society, as well as the York and other horticultural societies, have testified by their awards of medals, I am induced, at the desire of many friends, to lay my practice before the public, hoping that it may be favourably received; and most happy shall I be, if it is proved that I have contributed my mite to the science of horticulture.

J. R.

CONTENTS.

CHAPTER I.—Page 1.

On the formation of Borders suitable to the growth of the Vine.—The opinion of different Authors.—The Author's remarks.—Sorts of Composts and Manures recommended; with a detailed account as practised by him.—Hints for improvement in the future formation of Borders.

CHAPTER II.—Page 13.

Sorts of Grapes recommended for the Vinery and Succession Pine Stove.—A view of the different methods of propagating the Vine.—Author's practice, to bring it soonest into a permanent bearing state.—Structure most suitable for propagating the same.—Soil.—Potting.—Watering.—Temperature.—Pruning, &c., &c.

CHAPTER III.—PAGE 26.

On planting the Grape Vine.—Proper Season.—Different methods of planting, with remarks on the same.—Author's method of planting both inside and outside the houses, and after-management.—Attention to the Root, insisted on, to improve the puny specimens of fruit generally seen through the country.—Liquid manure, use of.—Temperature of the same.—Close attention to Summer Pruning essentially necessary.—Atmosphere, humid one recommended.—Winter Pruning, resting of the wood, &c., the first year.

CHAPTER IV.—PAGE 45.

Information relative to their second year's progress.—Time of beginning to force.—Crop of fruit the Vines will be able to produce from their first year's wood.—Attention to the root, the Author's reason for the same, to avoid that worst of all diseases to the Vine, the shanking and shrivelling of the foot-stalks and fruit.—Summer Pruning.—Temperature recommended in all stages throughout the year.—Humidity of the same.—Judicious thinning of the fruit, so as to reduce it to fixed principles.—Stopping of the shoots, &c.—Winter Pruning.—Resting of the wood the second year.

CHAPTER V.—PAGE 60.

The Vine, now arrived at perfection, so as to bear a permanent crop of fruit, from wood the growth o two years after planting.—Which is not generally attained earlier than the fourth or the fifth year.—Time of beginning to force.—Attention to the roots, the neglect of which is the rock on which most Gardeners split.—Close attention to their progress—Summer pruning.—Thinning.—Temperature.—Humid one, so as to produce superior fruit.—Colouring of the fruit, with remarks on the same.—Winter pruning, different methods.—Author's method, so as to produce precocity.

CHAPTER VI.—PAGE 79.

The vine now arrived at the third year, firmly established.—Time of beginning to force and after-treatment.—Insects injurious to the vine.—The foregoing remarks attended to, little injury will accrue to the vine.—Composition, the most simple the most efficacious.—Conclusion.

at all times to ascertain. The ill effects would soon be visible, as the heat at the root, I presume, could not be dispensed with until the grapes had changed colour, and if not properly supplied with moisture, (as every one having pretensions to growing good specimens of this noble fruit must know,) the effect would be, the vine making the greatest demand on the roots at the time that they, being drawn to the bottom of the border, by the heat given out by the pipes, would have to traverse, in search of moisture, a dry soil, on the surface of the flag, with the hot water-pipe beneath. Thus, the mouths or spongoiles would become incapable of exercising their proper functions—would wither and dry up—and the effect be, a crop of shank'd and shrivelled fruit, no matter what age the vine might have attained.

To obviate this defect, I should recommend, instead of a border two feet six inches deep,

with one huge stone every six or eight feet square, to put four or five in the same space; allowing the border, when filled and settled, to be from fifteen to eighteen inches deep, and to plant the vines as near upon the surface as possible; you would then be better able to add a top-dressing to your border every autumn, so as to feed and keep the roots of your vines near the surface.

As to the means of employing bottom heat to the roots of this most generous of all exotic fruits, I shall explain my system in its proper place, as, upon the right application of this stimulus, greatly depends the successful culture of the vine.

CHAPTER II.

Sorts of Grapes recommended for the Vinery, and Succession Pine Stove.—A view of the different methods of propagating the Vine.—Author's practice, to bring it soonest into a permanent bearing state.—Structure most suitable for propagating the same.—Soil.—Potting.—Watering.—Temperature.—Pruning, &c., &c.

There is, and long has been, a diversity of opinion amongst practical men, as to the varieties of grapes best adapted for early or late forcing, almost every gardener having his favourites; so that the question, as to which are the best suited to our climate, has never received an answer, as a guide to the tyro or amateur; nor is it probable that it ever will, perplexed, as the inquiry is, by the puffing

daily in the papers of some or other new seedling coming out, generally specified as embodying the flavour of the best kinds in cultivation.

A most injurious consequence follows from this cause: gardeners are induced to purchase these plants for new houses, and many a noble structure, raised for the growth of the vine, is in part planted with this comparatively worthless trash, to the great disappointment (when arrived at a bearing state,) of both the employer and employed. There is then no alternative but either to re-plant—to lose two or three years—or to inarch from some known good sorts.

I have long had a wish to suggest, through some of the many horticultural periodicals, the incalculable benefit that would arise from the formation of a society in London: a council or committee, including some of our best practical men, to try, discuss, and give

unbiassed opinions on the merits or demerits of all seedling fruits, before they are pronounced worthy of cultivation, (similar to the Floricultural Society for flowers). Such a society would meet with great encouragement from gardeners generally, and I, for one, would gladly subscribe, to keep up a fund, to enable some of the practical members to attend from the country; their meetings to be held once a month or six weeks, or as often as was deemed useful for the object for which they would be instituted.

The limits of this work will not allow me to give a lengthened catalogue of grapes in cultivation, nor is it my intention, but to confine myself to a few known good varieties, which, by proper attention, I hope will be found quite ample for my younger brethren and amateurs.

As sorts suitable to plant a vinery for early forcing, I should recommend the following;

others may be added as fancy may suggest :—

Black Hamburgh: a rich fruit; a most certain bearer. Black Prince: not so pulpy as the last, but by many thought superior in flavour. Cannon Hall Muscat, a seedling from Muscat, of Alexandria: a noble fruit, of a high musky flavour, requires artificial impregnation in setting; the largest white grape in cultivation. White Muscat Alexandria: similar to the preceding; seldom attains the same size of berry. New Dutch Sweetwater: a large round white grape; rich fruit, delicate and thin skinned. Chassells Musque: a high flavoured grape, good sized fruit; the berries apt to crack with too much moisture.

I consider these varieties sufficient for the rafters; if any are planted against the back wall, I would say :—Black Hamburgh, Black Frontignac, New Dutch Sweetwater, White Muscadine, Chassells Musque.

Sorts for the Succession Pine Stove :—

Cannon Hall Muscat, Muscat Alexandria, New Dutch Sweetwater, White Nice, Black Hamburgh, Black Prince, Black Damascus, requires artificial impregnation.

Sorts for a late vinery:—Black Hamburgh; Black West's St. Peter; Black Morocco, a valuable late grape, eats rather hard but good flavoured; Royal Muscadine, if true, a white grape, very prolific; White Muscat; White Muscadine, differs from the Royal, smaller in the berry.

Sorts for the rafters of a Greenhouse:—Black Hamburgh, Black Lombardy, Royal Muscadine, White Muscat.

The above sorts I can, with confidence, recommend. I consider them the cream of a lengthened catalogue, though it includes more showy names to attract the unwary, and they are select as regards the Vinery and Succession Pine Stove.

It will be admitted that there are various

opinions as to the best method of propagating the vine, so as to bring it soonest into a permanent bearing state.

It has been shown, in the Gardeners' Magazine, that excellent vine plants may be raised to plant a vinery or other houses permanently, on the following system:—At the winter pruning leaving shoots of young wood, that would otherwise be useless and cut out, of a sufficient length of cane to be bent down to pots to receive them, as layers. As soon as it is ascertained they have begun to make root proceed to weaken their resources, by making incisions behind the pots, so as to disengage them by degrees from the parent plant. They will make from ten to twenty feet of wood the same season, and are then ready to stock a new house, as permanent plants, without any check in their growth.

The paramount importance of this plan, from the conclusion I draw from the author's

recommendatory practice is, that they are able to produce a crop of fruit for table the same year as planted. If that fact could be established, we should not have much occasion for complaint by the employer or employed.

I may be allowed to make a remark upon this method, which I candidly confess is, in my opinion, a bad one. A layer raised as above, planted and pruned back to twelve feet; would it be possible that it should develope itself properly the first year, independently of carrying a crop of fruit, the top would demand that support which the root would be unable to supply; except, as I have lately read, where it was asserted by an author that the top could live on thin air. If not intended to fruit, whatever advantage would be gained by this system, it can as soon be attained by a single eye with better permanent plants, as the roots would be proportionate to the top, as I hope in these hints I shall be able to show.

Other methods have been and are practised in propagating the vine: by long cuttings two feet, shorter cuttings, four or five eyes, and cuttings having a single eye or two of the young wood and part of the bottom of wood of last year, and others by single eyes.

Most of the above methods I have tried, but by single eyes is the method I most approve.

The structure I should recommend, as most suitable to the propagation of the vine, in size according to the number of plants wanted, is, a pit, such as are used for cucumbers, melons, or succession pine plants, of two, three or more lights; a common flue or hot-water pipe making a circuit round the pit will give a perfect command of top heat, for the better perfecting of the growth of the young plants during the season. I particularly warn my younger brethren against any check given to the vine in any stage after it has commenced

its growth, until it has perfectly ripened its wood.

There are different opinions as to what part of the vine is the most proper to propagate from; some recommending the lower part of the shoot, and others the extremity. It is a question of no moment with me, providing the wood is plump, short jointed and well ripened, which, if the parent vine has been properly treated, it cannot fail to be. Having, at the pruning season, secured your prunings, in February, or early in March, proceed to prepare your eyes for potting. Choose bold, prominent buds, taking two inches of wood, on each side cut a little sloping, opposite the eye, then pot singly, in 32 sized pots, using leaf mould and sandy loam in equal parts. If prepared and potted a fortnight, and placed in the back shed before their removal to the pit, they will be better, as the pores that were cut will have dried up if the soil were moderately dry.

Presuming your pit is ready, having been filled with stable-dung and collected tree leaves, so as to command a bottom heat of 80 or 85, which you can easily ascertain by inserting a Farenheit's thermometer to the depth of a foot, and by trial-sticks thrust into the bed, proceed to plunge in your pots, which you may safely do, being rather sparing of water the first fortnight or three weeks, and never using the water at a lower temperature than the heat of the bed.

The temperature of the pit must not exceed 55 by day, and may be allowed to fall to 45 in the night, until the buds are in motion. They will then require a little more heat, raising the temperature gradually until it attains 55 by night by the time the first leaves are fully expanded; always allowing them 10 or 15 degrees more by day, or sun heat, keeping a moist temperature, syringing and shutting up early in the afternoon. By the

time the shoots have grown a foot or eighteen inches, examine the roots; if they have been properly attended to they will require removal into larger pots, (adding a little more loam and rotten dung at each succeeding potting,) you may now remove them into pots two sizes larger, or sixteens. If the heat of the bed has declined, add a little more fermenting material, then plunge as before. They will now require attention, training them to stakes in a slanting direction towards the back of the pit.

All the pruning they will require will be, to pinch off all laterals and tendrils, as they appear, with the exception of one or two towards the extremity, to serve in case of accident to the lead. They will now be making great progress; pay every attention to watering, giving air, &c., using the drainings of the dunghill, diluted with one-half water, but now, and at all times that they require it, by all

means use it at rather a higher temperature than that of the bed. Raise the temperature by day to 80, 85, or 90, by sun heat—if by fire 72, or 75, syringing and shutting close up, early in the afternoon, allowing the temperature in the night to fall back to 58 or 60, by which treatment you will be able to produce fine round and short jointed canes, that will prove ornaments to the houses intended to receive them. Examine the roots if they are become matted and have filled the pots; you may give them another potting before the end of May. When the canes have attained the length of six or seven feet, pinch off their lead, so as to throw their strength back, to the more perfecting the cane and buds intended to be left.

As you perceive them ripening, withhold water by degrees, giving plenty of air, drawing the pots up to the surface of the bed by degrees, which will facilitate the ripening of

the wood, when it is perfectly ripened, to the length of five or six feet, (the length I recommend for outside planting,) prune back to that, then disbud the whole cane, that is, cut every bud clean out (leaving the leaves uninjured) with the exception of the two uppermost, as there will now, by keeping the pit cool, be no danger of breaking, and the food still gathered and stored up by the roots, will go to the support of the remaining buds, and cause them to break more strong and bold in their new situation the following spring, as the leaves change colour you may remove the plants to a north wall, mulching the pots with litter, there to remain their winter quarter or period of rest.

By close attention to the above hints, you will be able to raise strong healthy plants, that will be able to carry a partial crop of fruit after being planted one year. Where there is not convenience for raising young plants, upon

ripened, so that in September I am enabled to give them a light top-dressing (though only the first year) of ground bones, loamy soil, rotten manure, and decayed carrion—these manures are all, I have proved, great fertilizers of the vine—covering the whole with an inch or two of half-rotten stable manure, to prevent evaporation. The rains that fall in October and November will wash the gases down amongst the fibres, as will be observed by the extraordinary progress they will make the following year, in comparison with the puny specimens we generally see. The vines planted inside the houses will require attention at the root: they want great support as their foliage becomes fully developed. I make use of liquid manure diluted as aforesaid, and clear rain water, alternately, but always in a tepid state. I never allow a vine or peach border inside the house to be watered with cold water after vegetation

commences, until the fruit or wood is ripe. At this place I have warm water very convenient, as the houses are heated on the Lever system of hot water, which I prefer to any new system I have seen, the pipes from the boiler working into and returning from a reservoir at the other end of the house that will hold from thirty to forty gallons of water, so that independent of keeping up a more equal temperature all over the house, I have always clean hot water at command, in the forcing season.

CHAPTER IV.

Information relative to their second year's progress.—Time of beginning to force.—Crop of fruit the Vines will be able to produce from their first year's wood.—Attention to the root, the Author's reason for the same, to avoid that worst of all diseases to the Vine, the shanking and shrivelling of the foot-stalks and fruit.—Summer Pruning.—Temperature recommended in all stages throughout the year.—Humidity of the same.—Judicious thinning of the fruit, so as to reduce it to fixed principles.—Stopping of the shoots, &c.—Winter Pruning.—Resting of the wood the second year.

PRESUMING that all has gone on favourably the last season, you may expect a nice sprinkling of grapes from your young vines only planted one year; but I caution the tyro

not to be anxious in wishing to produce very early grapes; if too sanguine, he will do this at the expence, and to the great detriment, of the future welfare of his young vines. The first, or middle of March, I consider sufficiently soon to begin forcing, the second year, as, by the time the buds are in motion, we are commanding more sun and light, for the more perfect development of the foliage and infant fruit. A few days previous to taking in your vines, lay on the border, to the width of twelve or fourteen feet, good fermenting stable litter and leaves, to the depth as mentioned for last season. At the time of taking in your vines, if not done in autumn, give them a good washing with the composition I recommend in the latter part of this work. The time your vines will take to break will be a fortnight or three weeks. I generally keep my vines tied horizontally along the front until every bud is in motion.

I would advise not to be hasty, but to keep a low temperature in the night, say 45, till you perceive them all moving; 15 or 20 degrees higher in the day will do no harm, by sun heat, if you attend to the night temperature: syringing them morning, noon, and night, and keeping a very humid atmosphere.

When you perceive the buds fully broken, you may then tie them up to the roof. In early forcing I generally sling them to the wires, keeping them two feet from the glass, until all danger of frost be over. The buds or shoots will now be elongating in a very strong and bold manner; if they are properly attended to, you may raise the temperature gradually in the night up to their time of showing fruit 8 or 10 degrees—the same by day, observing to keep up a very humid atmosphere, as, under a clear sun, the young foliage has a great drain upon it by evapo-

ration, to a greater degree than when arrived at a more mature state. Syringe lightly, and close your houses early in the afternoon, say, in March, two o'clock; April, half-past two; May, three, and so on, as the season and fruit advance to maturity. Your vines will now be showing three or four bunches at every eye left at winter pruning; attend particularly to summer pruning, and by no means leave more than one bunch upon each shoot, and one on the leading shoot. Single out the bunch you intend to attain maturity, taking the others off, stopping the shoot one, or at most two joints above the bunch—it is immaterial which, my practice is to stop at one joint above—taking off all laterals and tendrils as they appear. The leading shoot must be kept neatly tied up, divesting it of laterals, &c., as for last season, until it reaches the top of the house, you may then stop it, leaving the extreme lateral or two to

keep it in check, as well as one upon each spur, if danger is to be apprehended from the breaking of the natural buds, which will not be unlikely, as your vines, if this system has been followed out, will be growing very strong. As they approach the time of blooming, raise the night temperature gradually to 65 or 68, increasing the day temperature in the same ratio, keeping the house when the vines are in bloom rather dry. You will have the pleasure of seeing them in a healthy and robust state, and as the bloom falls, you will find the infant fruit assume a very bold appearance, the berries having a strong and turgid footstalk. I must not omit to mention here, that there are some kinds of grapes that do not set their fruit well, owing to a defect in the anther or parts of fructification, to remedy which, I generally apply, with a pencil, the pollen of some free setting kind, as the Black Hamburgh and others. I, likewise, in the early part of the

day, when the weather is fine, give the vine a good shake, which will be found very beneficial in setting the anthers free, and dispersing the pollen. Another practice is to leave a few extra bunches on the back wall, taking them off when in full bloom and applying them as aforesaid. The Cannon Hall, Black Damascus, and Black Morocco are amongst these shy setting kinds.

In the course of a few days after the bloom has dropt, your young fruit will be in a fit state to commence thinning. I am an advocate for early thinning, an operation that requires the greatest caution, and that, in my opinion, does not receive a tenth part the attention it deserves. How often do we see what would have been splended specimens of fruit, as small as marrow peas, wedged together as hard as a stone. There is no operation we perform on the vine in which there is more room for improvement, nor one

more easily reduced to fixed principles, than the thinning of grapes. I will attempt to explain in a brief manner, the practice I follow. Some kinds of grapes, as the Hamburgh, Muscat, Black Prince, Nice, and many others in well-grown specimens, produce large shouldered bunches; others as the Frontignacs, Sweetwaters, Tokay's, and others, are more generally what may be termed close growing kinds. I have the last-mentioned sorts, and the produce of these young vines at this place generally ~~have~~ shouldered, which is not often the case at a more mature age. The time of thinning I recommend, is when the berries are well set, or attain the size of No. 2, or 3, shot, beginning at the bottom of the bunch, leaving the leading berry if possible, and according to the kind of grape, having care to thin judiciously, as there is great difference between the Cannon Hall Muscat and Frontignacs as to size. As you

proceed thinning upwards on the bunch, say, for an inch or two, more or less, from the bottom, you find the peduncles, or footstalks, or what more technical term you may apply to them, to consist of three berries (the leading one, and one on each side,) my practice is to leave the lead or centre berry, taking off the other two. As you approach higher up the bunch, or approaching the middle part, such sorts as the Hamburghs form a sort of secondary shoulders, and upon the sides of these you will find them set on in threes; proceed to thin, as for the bottom, leaving the leading berries, taking off the side ones as before, proceeding upwards to the top of the bunch to the main shoulders, suspending or raising the shoulders with strands of soft matting, and thinning the same as before mentioned, taking care to remove all inside berries, as they scarce ever colour well, and if the grapes have to hang long on the vine, they

contribute to mouldiness in damp weather. The above system of thinning leaves a bunch equally balanced, each berry acting its own part and not robbing another will be found to assume a strong bold footstalk, and be regular as to size in every part of the bunch.

Many practical men may condemn this plan as being severe; but I will answer for its superiority over the general system of taking the berries out at random. Your bunches thinned on the system recommended, the berries may appear thin and straggling, but you will find, by keeping a low temperature in the night, say 65; and 85, 90, or 95 in the day, with a very humid atmosphere, in the course of a few days or a week, the bunches will have filled amazingly. The support that would have been distributed in the supply of three times the number of berries, will be directed to the growth of the remaining few, producing noble large swelled berries, with a

bold turgid footstalk; such bunches and specimens as are seldom seen, have, by this system, been the result at this place.

It has been recommended to use a small piece of wire, and other contrivances, at the time of thinning, so as not to touch the bunches with the hand, all of which I discard. It might be detrimental to the fruit if a person touched it with hands wet with perspiration, such men ought to use a pair of thin gloves, and all should be very careful not to touch the fruit with the head, when in a state of perspiration, as it certainly will retard the swelling of the berries, and make them appear as if they had got the rust. Giving them a good thinning early, as recommended, will be found productive of great good, if noble specimens of fruit be the object sought to be obtained. They generally will want no more thinning until stoned and swelling, they should then be gone over again, the inside berries removed, and such others as occasion may require.

I hope I have given a sufficiently lengthened and plain statement of my practice of thinning, and at this place, I can, to any one, give ocular demonstration of the working of my system, which I have never seen or heard of in operation elsewhere. If all has gone on well, the berries will be fast approaching stoning; maintain your heat by day, giving a little air, as before mentioned, if cloudy cool weather should intervene, keep up a brisk heat by stirring well your fires early in the morning, and up to mid-day keeping up to 80, or 85 with a very humid atmosphere, allowing your fires or boilers to cool down in the after part of the day, you will be able to do without fire in the night, as before; it is my practice to give heat with light, and to reduce it with approaching darkness. I wish again to remind the tyro and amateur, that to grow grapes well, a vine, after vegetation is commenced until the fruit is ripe, should never receive

any check whatever. We will presume, by this time the grapes are sometime stoned, and changing colour, they are approaching that period when you are either to expect fine fruit, or mortification, but if the directions are strictly followed, as given in these pages, you cannot fail to reap a due reward for all your care and attention.

Again examine your outside border, if the heat has much declined, take part away, adding more fresh in its place, working all well up together to cause a brisk heat, which should be kept up till your grapes are nearly coloured. Many would remove the manure from the roots altogether at this time, a very great error, from which arises that bane of grape growers—shanking of the footstalk of the berries, by which many a noble bunch becomes mutilated ere fit for table, and a disgrace to the disappointed gardener. Frontignac, Muscats, and even Hamburghs are often seen thus disfigured, a cure

for which will be found in shallow and well drained borders, and in a moist heat at the root of the vine equal or higher than what the top enjoys, at the time of changing colour and until nearly ripe. Every gardener that has had practice in growing this fruit must be well aware that the berries at the time of changing colour have nearly half to swell if well grown. Consider for a moment, the top enjoying a temperature of 90 or 95 and the root comparatively starved at one of 48 or 50 degrees, is it reasonable to expect it can exercise its proper functions so as to supply the demand the top must make in so much more favourable a temperature—the greatest demand, too, being made on the root in the last swelling of the fruit. I have given both systems a trial, and have had the above kinds shanked under the experiment, but by keeping the roots in a somewhat corresponding temperature with that to which the top was exposed, shanking and

shrivelling has been discarded, and the effect produced, noble specimens of grapes without a shanked berry upon them, no matter whether a wet or dry season. By practising the above, you may give air as at other stages, when required. The opinion of some modern writers that the disease proceeds from a draught of cool air being let into the house, has partly recommended the hot air principle of heating forcing houses; but if any one will give what I have recommended a trial, he will find it the *multum in parvo* of all that is wanted in the good culture of the vine, as regards the prevention of this worst of all diseases.

After the fruit has done swelling, you may remove the dung by degrees from the root, and discontinue the humidity of the house, as the wood will, by this time, be pretty well ripened, keeping up a brisk heat with plenty of air, so as to colour the fruit more perfectly, after which time you may lower the house

by degrees, keeping it cool and dry, if you want to preserve the fruit any length of time unimpaired on the vine. If by this time, your wood appears ripe, though the leaves may not have as yet much changed colour, you may disbud your leading shoot, as mentioned for last pruning season, shortening it so as the joint of two years growth may reach fifteen or sixteen feet, likewise as the fruit is cleared you may prune your spurs (on the last year wood, or those that have borne fruit this year,) cutting them into two eyes. Give your border, which, by having been exposed as mentioned for the period of the year, will have been of great benefit to the roots, a top dressing, and in all other respects follow what was recommended for the previous autumn.

CHAPTER V.

The Vine, now arrived at perfection, so as to bear a permanent crop of fruit, from wood the growth of two years after planting.—Which is not generally attained earlier than the fourth or the fifth year.—Time of beginning to force.—Attention to the roots, the neglect of which is the rock on which most Gardeners split.—Close attention to their progress—Summer pruning.—Thinning.—Temperature.—Humid one, so as to produce superior fruit.—Colouring of the fruit, with remarks on the same.—Winter pruning, different methods.—Author's method, so as to produce precocity.

As the season approaches to start your young vines, with their wood the growth of two years, many would object to letting them carry a heavy crop of fruit, but content themselves

with a light sprinkling, knowing it to be so averse to the old received practice of managing young vines, and that prejudice having taken deep root for years in only a moderate soil, is bad to eradicate. However, it has been my intention in these pages, to point out the errors, and improve upon the practice, of by-gone times, and I have been able to shew by experience, that every success will attend grape growers, if the foregoing instructions be implicitly followed, and that they will have the pleasure of seeing, from vines the growth of two years, a noble crop of fruit free from shanking or shrivelling (as has been frequently witnessed at this place, by many gentlemen, gardeners and amateurs,) what is not commonly seen till the fourth or fifth year after planting.

Presuming your vines were turned out last autumn as advised, your border renovated, &c., the middle of February will be soon enough

to start your young canes this season, as it would be very injurious to them to carry a heavy crop of fruit, and be started very early. Use caution, begin steadily, and you will be better able to succeed permanently, and may in succeeding years begin a few weeks earlier each year, by practising which you will bring them steadily into a proper state by degrees for early forcing. Strip them of any useless loose bark on the year-before-last wood, washing them with the composition as recommended for last season, tying them horizontally along the front. If the border on the outside has escaped your notice, pay immediate attention to it, as that neglect is the great cause of failure in the fruit of this most generous of all exotics. Proceed as before advised, and lay on to the depth of two feet, or two feet six inches, and four feet wider than you think the extremity of the root reaches of hot stable manure and

collected leaves; the leaves will assist the manure in giving out a more steady heat, and not so likely to vary with the weather, and if thatched with straw or covered with any other light dry material would retain its heat much longer.

Let the temperature at night be kept low, say 45 or 48 degrees, it may range in the day 15, 20, or 25 degrees higher by sun heat, with air, syringing the canes with tepid water three or four times in the day, maintaining a very humid atmosphere, by throwing water on the pipes or flues, and sprinkling the pathways. I caution to work steady, so as to break the whole of the eyes upon the young wood (there will be no doubt of the spurs) for, bear in mind, you, at winter pruning, left no more eyes than you absolutely wanted, therefore, proceed cautiously — you cannot afford to leave one unbroken; if that were the case they might break the next

season, but they would leave an unsightly and very perceptible gap the whole of this year. If you find they do not all break as you could wish, untie them and curve the shoots, bringing their extreme points down to the front, you will find them break more readily by this method, as it checks the current of sap, which is always powerful in strong young vines, especially as by this time the roots will be in active motion, and unless checked, by this, or by a somewhat similar plan, should the leading bud get the start, the sap will be diverted into it and one or two below it, and the consequence be that many buds will remain dormant. With upwards of seventy vines planted, I did not, in the second year, lose eight buds in the whole, by this system. If all has gone on well, in the course of three weeks or a month, your buds will be in motion, and as soon as you fairly perceive that, sling them up to the wires, two feet from

the glass, raising the extremity of the lead within one foot; it will cause the lower buds to break more boldly; lower the lead as you see occasion. I generally let the vines remain in that position until all the side shoots are stopped out of bloom and want thinning, especially the first house, as by that time there is no danger to be apprehended from the frost. Up to the time the grapes are commencing to bloom, keep up a very humid temperature by day, gradually raising the night temperature to 65 or 68 at the time of blooming, raising the day temperature in proportion. I always keep the house humid and close from the time the buds have sprung two or three inches until they are changing colour (when they are in bloom they will require to be kept rather drier); the day temperature is secondary with me providing it is warm and humid. I never give air after the shoots are stopped up to the fruit changing colour, till the thermo-

meter attains 80 degrees, and this being an humid and cold climate, in dull weather I have the boilers worked in the fore part of the day, letting them cool down in the afternoon, so that I use little or no fire in the night, but as I said before, give heat with light, and allow the house to get cool with darkness, the very reverse of the old practice in forcing the vine.

Presuming all has gone on well, your vines having broken every eye, having shewn an abundant crop of fruit, the house having been kept rather drier at the time of blooming, thinning of the superfluous ~~branches~~ bunches, stopping the shoots, and divesting them of their tendrils and laterals, having been attended to, the time of thinning the berries will be fast approaching. The Frontignacs and other close-growing kinds will be ready shortly after the bloom has fallen, the Hamburghs, Muscats, and other large-shouldered bunches, will come on in quick

succession. I therefore recommend the operator to be particular in carrying out what I I have before advised, under the head of thinning for last season, being well assured that by adhering strictly to what has before been stated, he will arrive at the desideratum. As your fruit proceeds in swelling, keep the night temperature to the point as stated for blooming, until the berries are stoned, you may then rise a few degrees, but at no period do I exceed 70 in the night. They will now swell apace, take off all laterals, keeping the house very humid; you may allow the temperature to rise by sun heat to 90, 95, or 100, or even higher, so that you keep a very moist atmosphere. Examine your border when the fruit is stoned, if the heat has greatly declined add more fermenting material, for upon this in an equal degree, as on the temperature of the house, depends the success of noble swelled fruit.

Your vines, if any planted on the back wall, or otherwise inside the house, must have every attention paid them as to moisture at the root, summer pruning, and in other respects be treated as the roof vines. When the foliage is fully expanded, and the fruit is swelling, they will require water at the root twice or three times a week, given in such quantities as reason may suggest, using it in a warm state along with the drainings of the dunghill, as recommended in former pages of this treatise. If all has gone on well, the berries will soon begin to change colour, be cautious they do not receive a check, the consequence would be, at this time, small puny specimens, a disgrace either to the practical man or amateur, to avoid which, keep up the heat and moisture in the day; you will then perceive by the time they are ripe, that they will swell one-half larger than by the old beaten track, which is as soon as they

change colour, to withhold moisture entirely, and to give less heat and more air, thus the plant receives a check in its vital functions, becomes suddenly paralized, and small fruit is the recompence for all the anxiety and care bestowed through the season. As the grapes approach ripeness, suspend by degrees the humidity of the house, keeping up a brisk heat and giving plenty of air. Examine the heat at the roots at the time the grapes are changing colour, if it has begun to decline, renovate it, keeping up a heat at the root as high or higher than the temperature inside the house, you will see the benefit resulting very apparent, in causing the grapes to swell to an uncommon size, with no fear of that pest, shanking and shrivelling. There are many causes assigned for that disease; I have given it my most anxious attention and have proved to my perfect satisfaction that the preventative is a heat at the root corresponding to the

temperature of the house, as recommended, and that the disease occurs generally when the heat is not so applied, (except with very shallow borders, and even then in humid summers).

If the root be kept as mentioned, all fears will be groundless, and perfect bunches produced, worthy of being placed upon the tables of Royalty. After your grapes are ripe lower the heat of your house by degrees, keeping it cool and dry, removing the dung from the roots, as recommended in previous parts of this work.

On the colouring of grapes, we often hear it remarked, that though perfectly ripe, many are not well coloured, black grapes more than white. I will state what has come under my own observation, and how the defect is remediable; the loss of colour in black grapes is, in my opinion, by an over abundant crop. It has occured here upon my young vines from

that cause, though the fruit was not the least deteriorated in flavour. By the old method of forcing the vine, it is the general practice in June to put out the fires, and to use little or none until September or October; the change may happen at the time the fruit is changing colour, the house is then lowered in temperature and kept cool and dry; by such practice black grapes will attain a good colour (if a light or moderate crop,) subject to shanking, and at the expence of size; and Black Hamburghs no more answer to their name as regards the shape of the berry than a Black Prince resembles a Black Damascus; you will always find that they are small finger, or oval shaped, whereas grown by the practice I recommend, they are large and nearly globular. There is still no cause to be disheartened by the above explanation, as it is quite practicable to grow fine noble swelled fruit and coloured to perfection; to

be certain of which, you must not allow the vines to carry too heavy a crop, keeping the temperature as recommended in all their stages of growth through this work. In giving an opinion on the defect in the colouring of grapes, it is not given as the sole cause, for, at the time I am now writing, I have Hamburgh, Muscat and other vines, carrying forty, fifty, and even sixty pounds weight of noble and good coloured fruit, and have never had a shanked berry on them, though the vines were only planted three years in April last. As to the colouring or becoming amber, white grapes are not so difficult to manage as black, time will produce that in white grapes which it sometimes will not in black.

As your crop becomes cleared, the foliage having changed colour, and shown indications of having rendered all the assistance due to the parent stem for the season, it will be time to think of winter pruning. You are

now to look forward to permanency as regards the fruitfulness of your vines, your method of pruning will in a great measure set the matter at rest. I will here advert to a few of the different methods I have seen practised, ere I revert to the system I recommend.

The long rod system of pruning the vine is by some practical men, held in the highest estimation, but that method, which I own has great merit, is not that, in my opinion, which will bring a young vine soonest into a permanent bearing state. It is my intention in laying my practice before the public, to show that single rod and spur pruning in preference to long rod, will bring a vine the soonest to bear a permanent crop of fruit. To follow the long rod system as generally practised, is to cut the young shoot down to two eyes; the first year the uppermost bud or shoot is allowed to attain the length of ten or twelve feet, but many allow them to reach the top

of the house (if not planted on the system I recommend they generally make weak canes, so that they are obliged to be cut down again the following winter pruning, which occasions the loss of one year), the second bud is allowed to run two feet, or two feet six inches, the uppermost shoot is headed back to five or six feet at the next winter pruning, or a third the length of the rafter, and the second shoot cut back to two eyes. The second year the leading shoot is allowed to make wood, so that at the second winter pruning, the growth of two years will attain to ten or twelve feet, or two-thirds of the rafter, the second shoot to be headed back to five or six feet, and the third cut down to two eyes. At the third winter pruning the leading shoot is cut to the the top of the rafter, the second to ten or twelve feet, the third to five or six feet, and the fourth cut down to two eyes.

It therefore takes, by this system, three

years' unerring success to furnish the rafter with wood (but oftener five years) and unless your vines are very strong, you cannot command a permanent crop the fourth year, likewise to carry out this system you have to provide a shoot from the bottom every year, sufficiently strong to bear pruning to the length of five or six feet, as the leading shoot after it has reached the top of the rafter, and borne a crop of fruit, is cut clean out to the bottom every winter pruning.

The merit this system has to recommend it, is said to be, that the bunches and fruit are finer upon the young canes than by the spurring method. This I can admit only partially, as I think that I have produced as fine bunches and fruit by my method of spurring as have been produced by the long rod system. However, to those who prefer the long rod system, I would suggest as a decided improvement, to disbud the young

canes as recommended for spur pruning, and as the young wood is laid in for bearing, to cut clean out all spurs (at winter pruning) in contact with them, from the leading or secondary shoots. As to single rod on the spur principle, practical men have their favourite methods, some pruning to a single eye, others cutting almost slill closer, depending upon the adventitious buds at the base, the vine having the appearance when pruned of a dressed crab walking stick; such vines are only partially fruitful, and the bunches very small. But, to return to the subject, we will presume your vines ready for the pruning knife, the foliage having shown indications of dropping (crop, gathered, &c.,) you may cut back your lead to within one foot of the top of the house, it will give you a little more cane, having disbudded it some time ago, you will only have left two eyes for spurs, and the leading one, proceed to prune downwards

on the vine, pruning your spurs to two, three, or four eyes, choosing a bold prominent eye or bud, (many may say they look unsightly, but you will be repaid with noble bunches on that head) leaving the uppermost eye for fruit, cutting clean out the others with the exception of the one at the base, which is to be retained, but on no account to bear fruit, as it is intended to prune back to it, the following year so as to bring the spur nearer home. I must not omit to mention that I have generally my bud singled out on each spur at the time I recommend for disbudding the lead, that is, taking off every bud above and below (not injuring the leaf) with the exception of the one intended to bear fruit, and the one above-mentioned for wood, the following year. Any one following this method will be greatly astonished by the strength of these buds when broke, and by the noble specimens of fruit they will produce

the ensuing season. As soon as the wounds are healed after pruning, which they will be, perfectly, in ten days or a fortnight, cover every cut you may have made with a little mild paint, they may then at your leisure be turned out for their period of rest. You will have removed the dung from the roots at the proper time mentioned for last season. You will bear in mind the renovation of the border and the protection, if required, from frost.

CHAPTER VI.

The vine now arrived at the third year, firmly established.—Time of beginning to force and after-treatment.—Insects injurious to the vine.—The foregoing remarks attended to, little injury will accrue to the vine.—Composition, the most simple the most efficacious.—Conclusion.

It may be argued by some, that by bringing the vine into a permanent bearing state, at the age I have been desirous of impressing upon the amateur and my younger brethren, as expedient, in the last chapter, I am entailing upon the plants disease and a premature decay of their vital organs. I wish to impress upon the minds of those whose prejudice has

got the better of reason, that, after the most mature deliberation, study and attention for years, of the nature and boundless vitality of this noble, but long neglected exotic fruit, we are still, in my opinion, in our infancy as regards its good culture, and ignorant of what it is able to attain. Presuming the season is again approaching for the developement of your young vines, provided you started them the latter end of February, last year, and you wish to have early fruit, you may begin three weeks or a month earlier, but by no means sooner, as it will be found the most conducive to their health and fruitfulness not to break in upon their habits too rashly; however, they will bear starting a little earlier, and you may, upon this principle gain time every year, until you have attained the end in view. I cannot give, at present, (though I have some experiments in course of trial,) better instructions for the management of this and suc-

ceeding years, than by following out the comprehensive culture the whole of the season as plainly laid down in the foregoing pages, urging the necessity of carrying out the whole practice as therein stated, by close attention to which, success will certainly follow.

Insects that prove the most injurious to the vine, are the red spider, cocus or scale, and the mealy or pine bug. The scale, if your vines are in good health, will seldom affect them to any extent. The composition I recommend, after stripping off the loose bark at winter pruning, will be found a perfect preventative for that pest. The pine bug is generally introduced either by the pine plant, or some other exotic stove plant; I have seen it make disagreeable work in the bunches, being obliged to use a feather to remove it. The plants that introduce this pest should be taken out of the house and steeped in

the following composition, at a temperature of 150, or even higher if on the pines, and the sooner the insects are destroyed the better, and the pit thoroughly cleansed with quicklime and sulphur, which will be found the most sovereign remedy. The red spider of the three is the most destructive, but by washing the vines with the composition previous to turning them out in autumn, and again before beginning to force, and by keeping the atmosphere of the house in a humid state at the times recommended through this work, when the crop is gathered, this nuisance can be remedied. Then the house can be syringed and kept close for a few days, or a week, which will be generally found to have destroyed those that have been engendered during the time the crop was gathering,

The following simple composition is what I make use of for peaches as well as vines, and find it answers well for general purposes:

To four pounds of Flowers of Sulphur add two pounds of Tobacco, four ounces of Nux Vomica, two pounds of Soft Soap, dissolved in five gallons of rain water, hot, well stirred, and used while fresh, laid on lukewarm with a brush, well rubbed into the wood and eyes, at the times before-mentioned.

Conclusion.—In this attempt to lay down my practice in as clear and plain a light as I am able, I hope I shall be excused the repititions, almost unavoidable on such a subject. In it will be found plain language and plain practice, (pirated from no one) from which I have had great success. I am aware, that in presenting these hints to the public, I expose myself either to the smile or the frown of the critic; whether he be lenient or severe, I must bear with patience the part allotted me, and only hope this work may be useful to some of my readers.

FINIS.

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